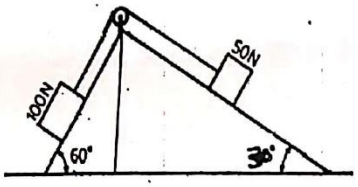

Fig. 6

(b) A ball dropped from the top of tower 30 m high. At the same instant a second ball is thrown upward from the ground with an initial velocity of 15 m/sec. When and where do they cross and with what relative velocity. [4]

-END-

Total no. of pages: 4 *Roll No.*_____

THIRD SEMESTER **B.Tech. (AE)**

SUPPLEMENTARY EXAMINATION **FEB 2019**

AE-201 Engineering Mechanics

Time: 3:00 Hour **Max. Marks: 40**

Note: 1. Attempt any five questions.
2. Assume missing data, if any

Q-1 (a) State and prove the Varignon's theorem. [4]

(b) Two spheres weighting 60 N and 100 N are connected by a flexible string AB and rest on the mutually perpendicular planes PQ and QR as shown in Fig.-1. Find the tension in the string which passes freely through slots in smooth inclined planes PQ and QR. [4]

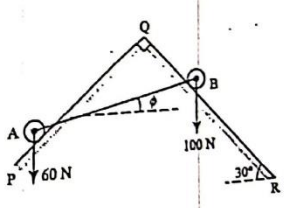

Fig.-1

Q-2 (a) Explain the different types of force systems. [4]

(b) Determine the reaction at the support at A, B, C, D as shown in Fig.-2 [4]

P.T.O

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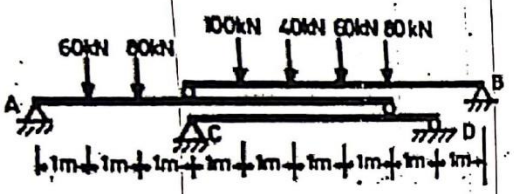

Fig-2

Q-3 (a) Explain parallel shifting of force. [2]

(b) Determine the forces in the truss as shown in Fig.-3. [6]

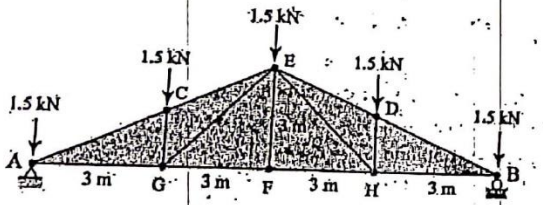

Fig-3

Q-4 (a) Define angle of friction and angle of repose. [4]

(b) Two blocks connected with a tie rod are shown in Fig.-4. If $\varphi_B=15^0$ and $\mu_A=0.40$, find the smallest value of W for the equilibrium of the system. [4]

P.T.O

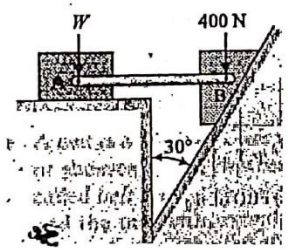

Fig.-4

Q-5 (a) Differentiate between work done and virtual work done. [4]

(b) Draw SFD and BMD of the load diagram as shown in Fig.-5. [4]

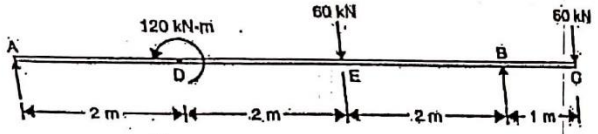

Fig.-5

Q-6 (a) Two rough planes inclined at 30^0 and 60^0 to the horizontal are placed back to back as shown in Fig.-6. The blocks are connected by a string running parallel to the planes and passing over frictionless pulley. Coefficient of friction is 1/3. Find the resulting acceleration and tension in the string. [4]

P.T.O